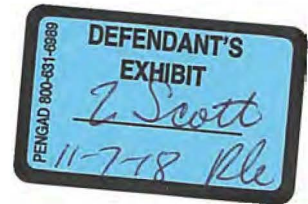


From: Powell, Allyn <ahpowell@regstaff.sc.gov>
Sent: Wednesday, March 2, 2016 10:22 AM
To: James, Anthony
Cc: Gary Jones; Sault, Gene
Subject: Final Presentation
Attachments: Presentation to Electric Cooperatives of SC 2016-03-03 FINAL.pdf;
Presentation to Electric Cooperatives of SC 2016-03-03 FINAL.pptx



Attached is Gary's final presentation with edits from this morning. My only comment is that I would still consider changing the title to include the words "Independent Assessment on Behalf of the South Carolina Office of Regulatory Staff", but that's up to you and Dukes.

Please let me know if there is anywhere else I need to send it.

Thanks!



GJE-Mails 2016/Vol 1 002315

Status of the V. C. Summer Units 2 & 3 Nuclear Power Plants

Presentation to the Electric Cooperatives of South Carolina

Gary C. Jones, President of Jones Partners, Ltd.

March 3, 2016



Brief CV of Gary C. Jones

G.J.E-Mails.2016.Vol.1.002316



- ▶ 45+ years in the nuclear power industry
- ▶ 32 years with Sargent & Lundy (S&L) in Chicago, Illinois
- ▶ 16 years as an Owner/Senior Vice President of S&L
- ▶ 2 ½ years with the International Atomic Energy Agency (IAEA) in Vienna, Austria
- ▶ Led the design and engineering on 3 major nuclear power plants
 - ▶ LaSalle County (Commonwealth Edison)
 - ▶ Marble Hill (Public Service Indiana)
 - ▶ Braidwood (Commonwealth Edison)
- ▶ Provided engineering, design and consulting services to over 50 nuclear power plants in the United States
- ▶ Professional project experience in Armenia, Canada, China, El Salvador, Finland, Hungary, Mexico, South Korea and Ukraine as well as throughout the United States
- ▶ Retained by South Carolina Office of Regulatory Staff (ORS) since August 2011
- ▶ Registered Professional Engineer in Missouri and South Carolina

A Very Good Idea in 2008

G.J.E-Mails.2016.Vol.1.002317



Why?

- ▶ Updated NRC regulatory environment under 10 CFR 52, which allows for a combined license to both construct and operate a plant
- ▶ Modular Construction
- ▶ Certified Design
- ▶ Success in Asia
- ▶ Base Load Review Act (BLRA) in South Carolina
- Source of non-GHG emitting and diverse power
- ▶ Engineering, Procurement and Construction (EPC) Contract

Experience Since 2008

G.J.E-Mails.2016.Vol.1.002318



Regulatory environment not as good as hoped

- ▶ Combined Construction and Operating License (COL) was delayed
 - ▶ 9 months until March 30, 2012
- ▶ "Build what you license vs. license what you build"
- ▶ Very strict literal compliance via NRC oversight
- ▶ License Amendment Requests (LARs)
- ▶ First plants through the Inspection, Tests, Analyses and Acceptance Criteria (ITAAC) process
- ▶ Not as much credit for previous experience in China as hoped
- ▶ Impact of changes from Fukushima accident

Experience Since 2008

G.J.E-Mails.2016.Vol.1.002319



Modular Construction

- ▶ Fabricators unable to reliably meet schedule and quality requirements
- ▶ Continuing design changes
- ▶ Inadequate constructability reviews
- ▶ Reassignment and de-scoping of fabricators

Certified Design

- ▶ Not as complete as anticipated
- ▶ Lessons learned at Chinese and sister plants
- ▶ Compliance issues with codes, standards and commitments
- ▶ SCE&G requested changes

Experience Since 2008

G.J.E-Mails.2016.Vol.1.002320



Asian Schedules Could Not Be Duplicated

- ▶ More rigorous regulatory environment
- ▶ Construction productivity rates lower than planned

BLRA Remains an Essential Element to Success

- ▶ Stable environment ensures project financing
- ▶ Independent study shows plant is still a positive

Still a Source of Non-GHG Emitting Power

- ▶ More focus on this issue due to EPA 111d
- ▶ Diversity in power supply remains important

Experience Since 2008

GJE-Mails.2016.Vol.1.002321



EPC Contract

- ▶ Multiple Changes in Ownership
 - ▶ Westinghouse/Shaw Stone & Webster
 - ▶ Westinghouse/CB&I Stone & Webster
 - ▶ Westinghouse (with Fluor as a sub-contracted construction manager)
- ▶ Multiple Amendments
- ▶ "Change in Law" provision interpretation led to disagreements
- ▶ Designer vs. Constructor

Current Status



Most of the following information is taken directly from a December 9, 2015 SCANA presentation at the 2015 Wells Fargo Energy Symposium. Some information, including the photograph on the first slide, was taken from a presentation given by SCANA on its February 18, 2015 Fourth Quarter and Full Year 2015 Earnings Conference Call.

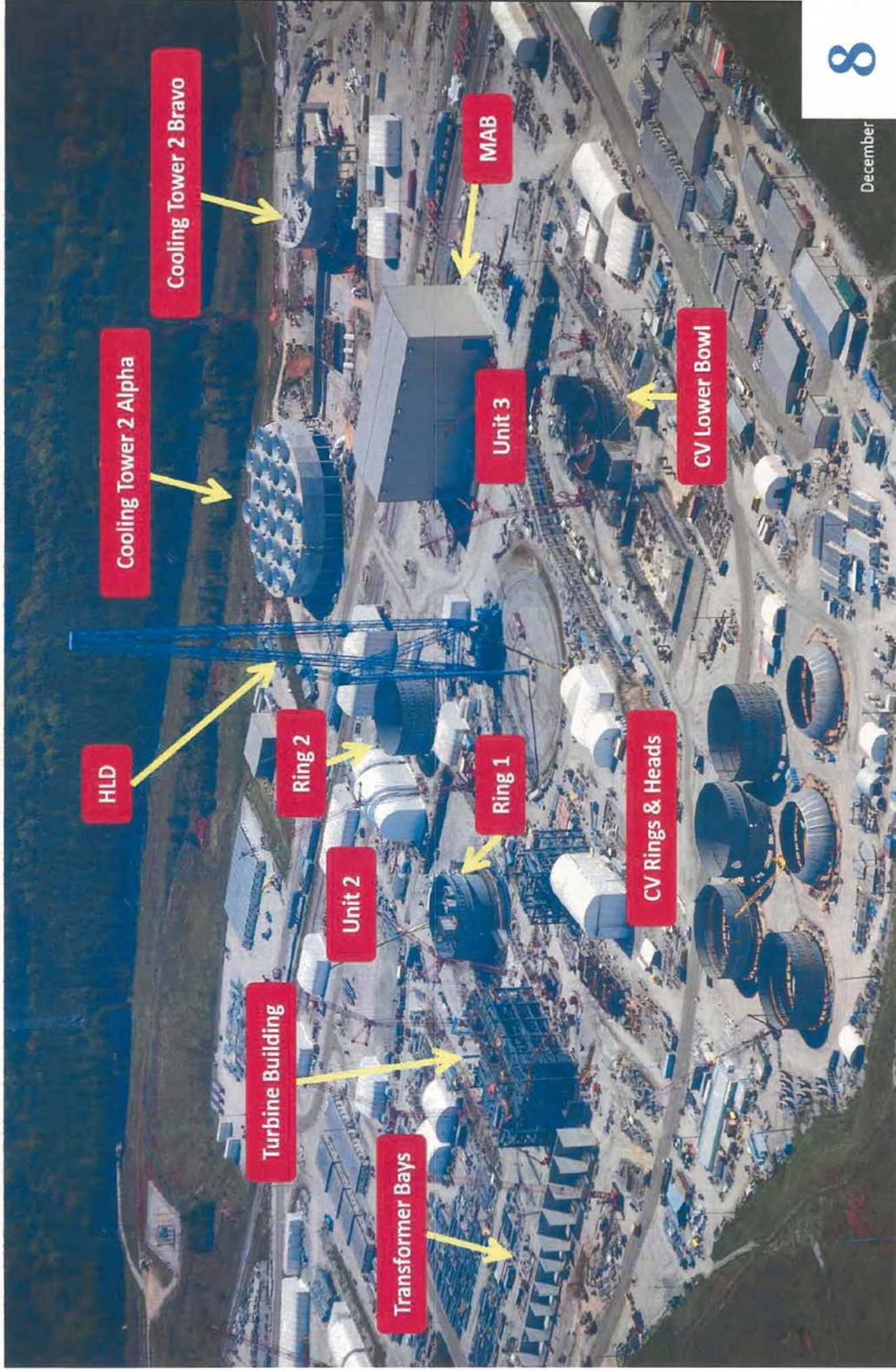
These presentations are available from the SCANA website at

www.scana.com/investors/webcasts-presentations

Site Overview

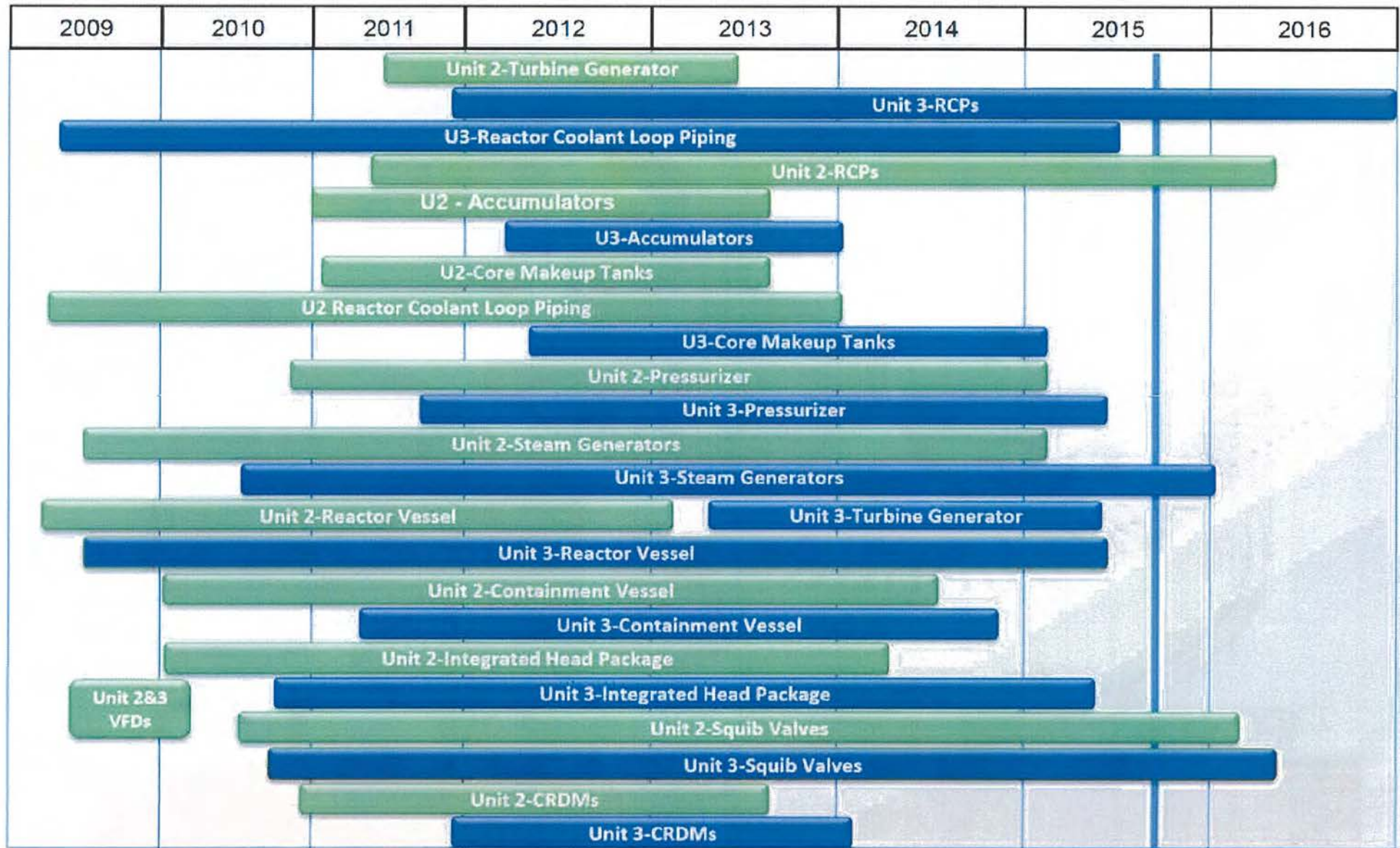
G.J.E-Mails, 2016, Vol. 1, 002323

(Picture from September 2015)



Status of Major Equipment

SCANA 2016, Vol. 1.002324



December
Current Position

“Big Five” Modules Inside Containment

CA Modules

CA01

CA03

CA04

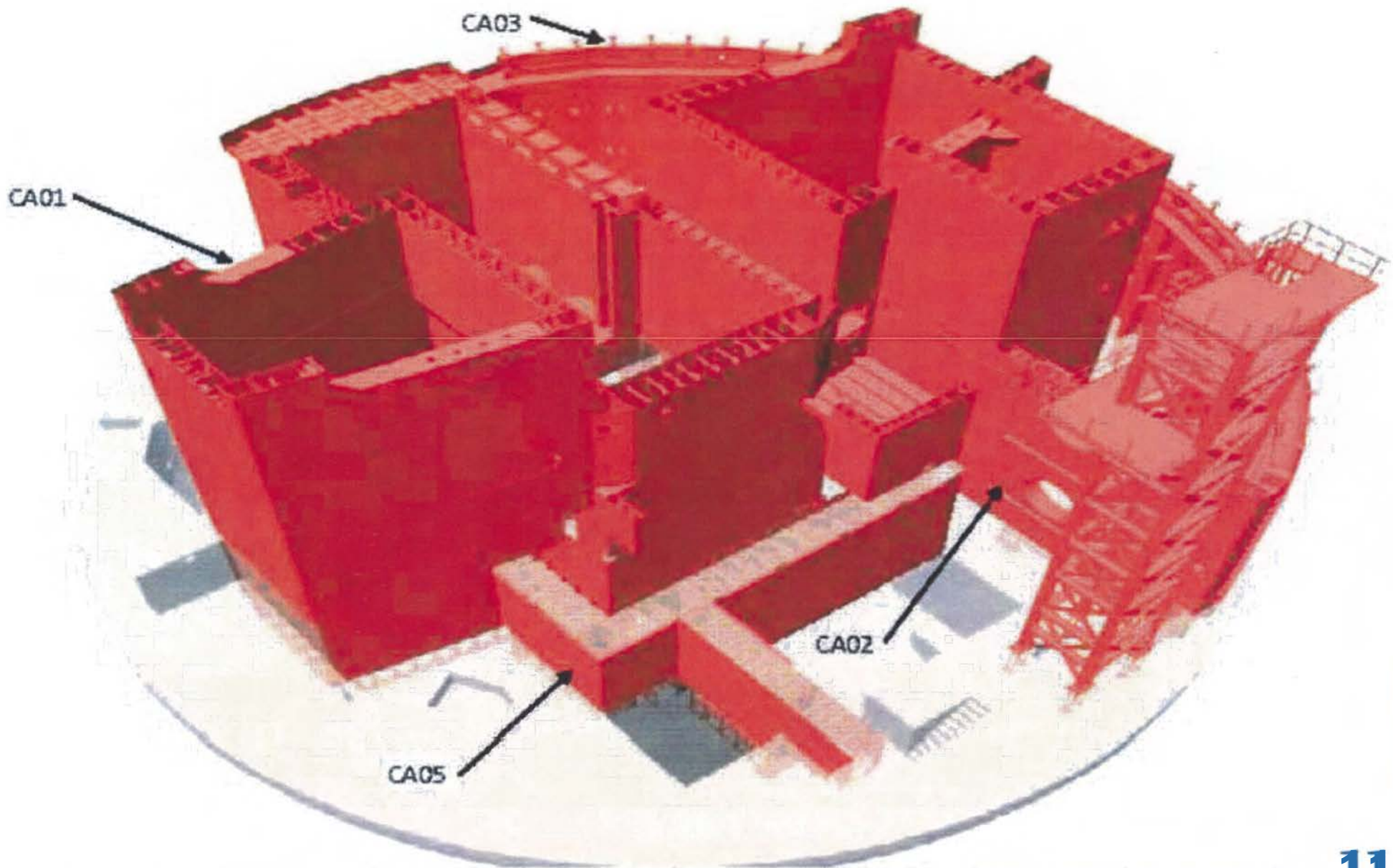
CA05

CA02

December 2015

10

"Big Five" Assembled



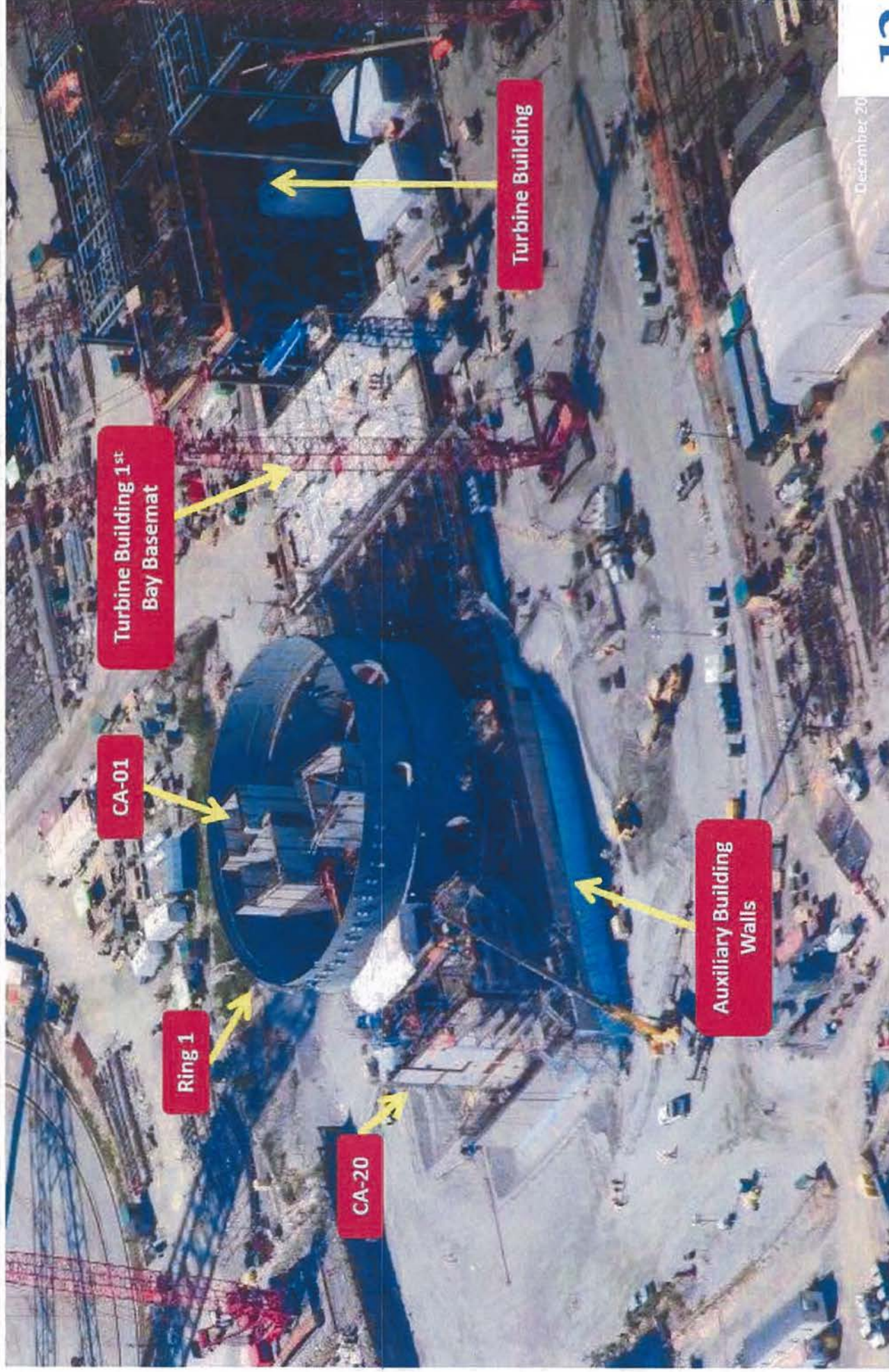
Module Status

G.J.E-Mails.2016.Vol.11.002327

	CA01	CA02	CA03	CA04 (No Concrete Required)	CA05	CA20
Unit 2	Installed Concrete fill to be determined.	Assembly Completed	17/17 sub-modules on site. 12/17 sub-modules on assembly platen. 3 sub-modules under on-site repair. Ready for hook June 2016.	Installed	Installed Concrete fill to be determined.	Installed Concrete fill is scheduled for April 2016
Unit 3	17/47 on-site. 6/47 on platen. Ready for hook in November 2016.	0/5 on-site.	0/17 on-site.	Installed	Assembly Completed Ready for hook in December 2016	68/72 on-site 22/72 on platen. Ready for hook in April 2016.
	Inside of Containment					Outside of Containment

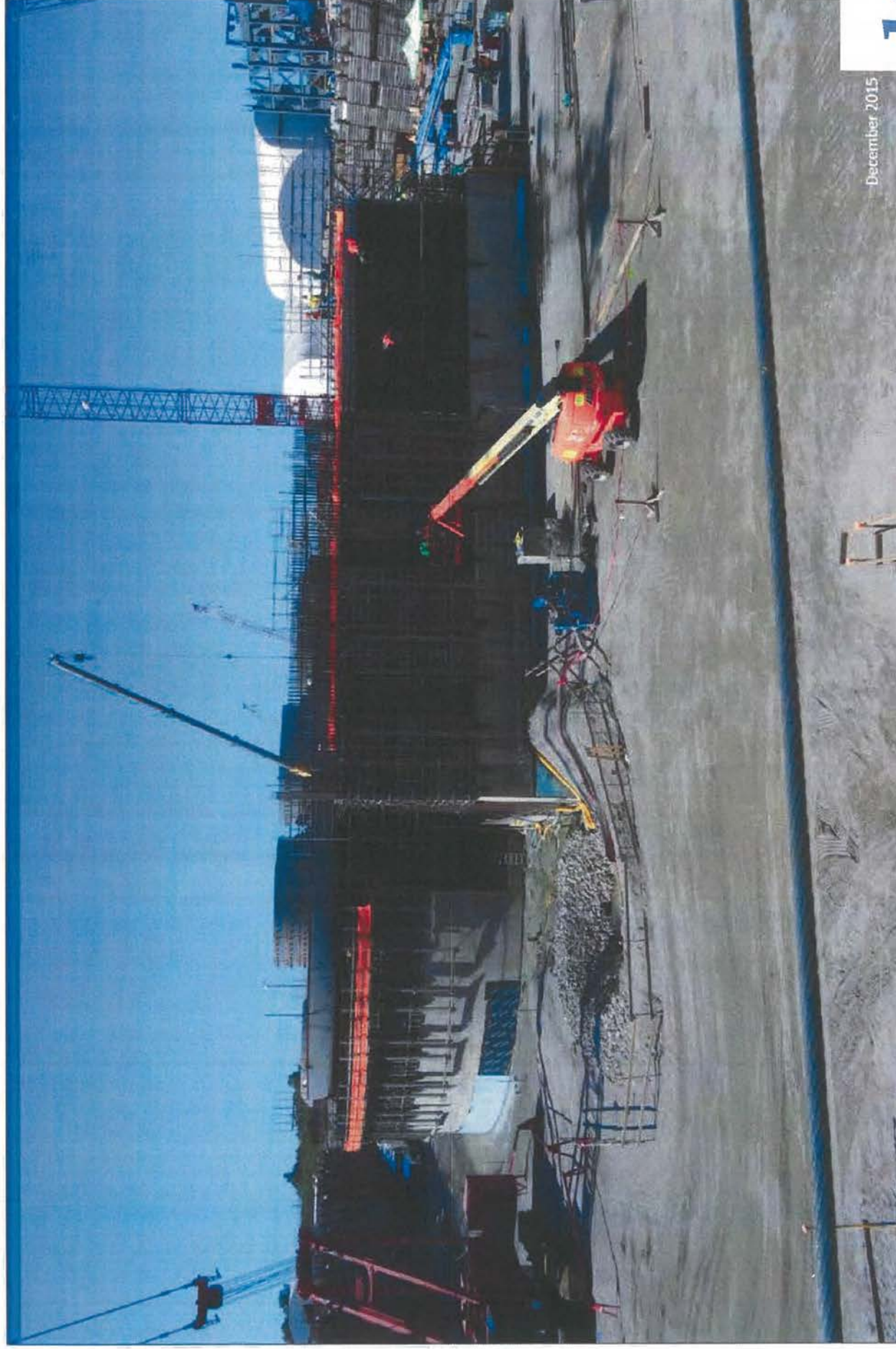
Unit 2 Nuclear Island

G.J.E-Mails, 2016, Vol. 1, 002328



Unit 3 Nuclear Island

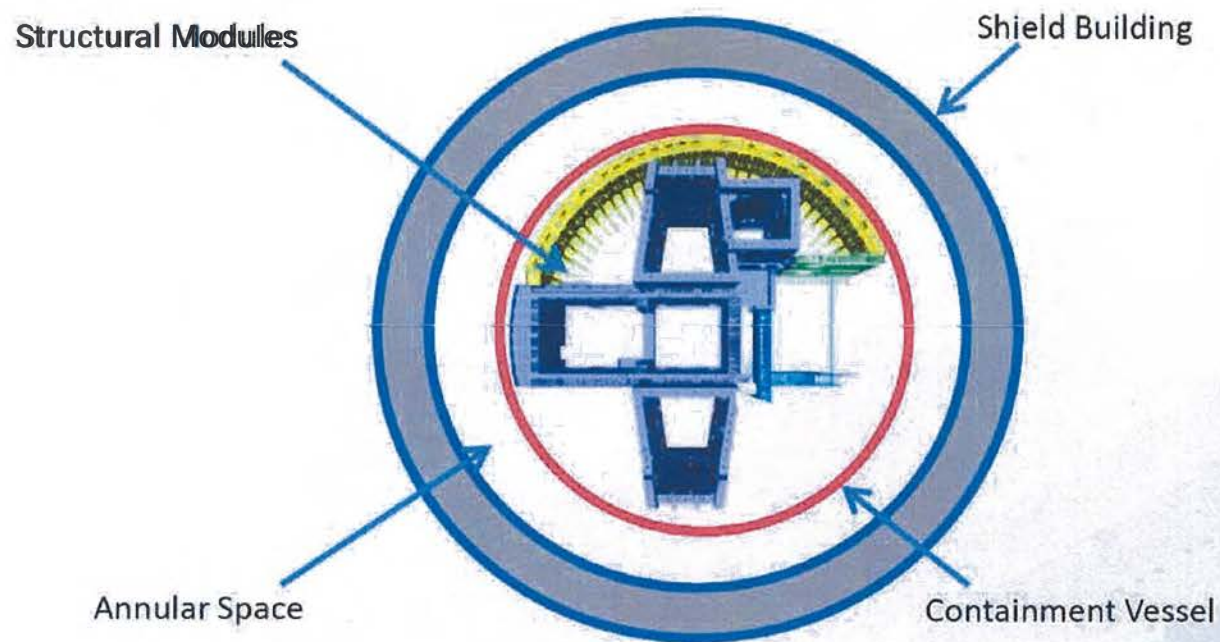
G.J.E-Mails, 2016, Vol. 1, 002329



December 2015

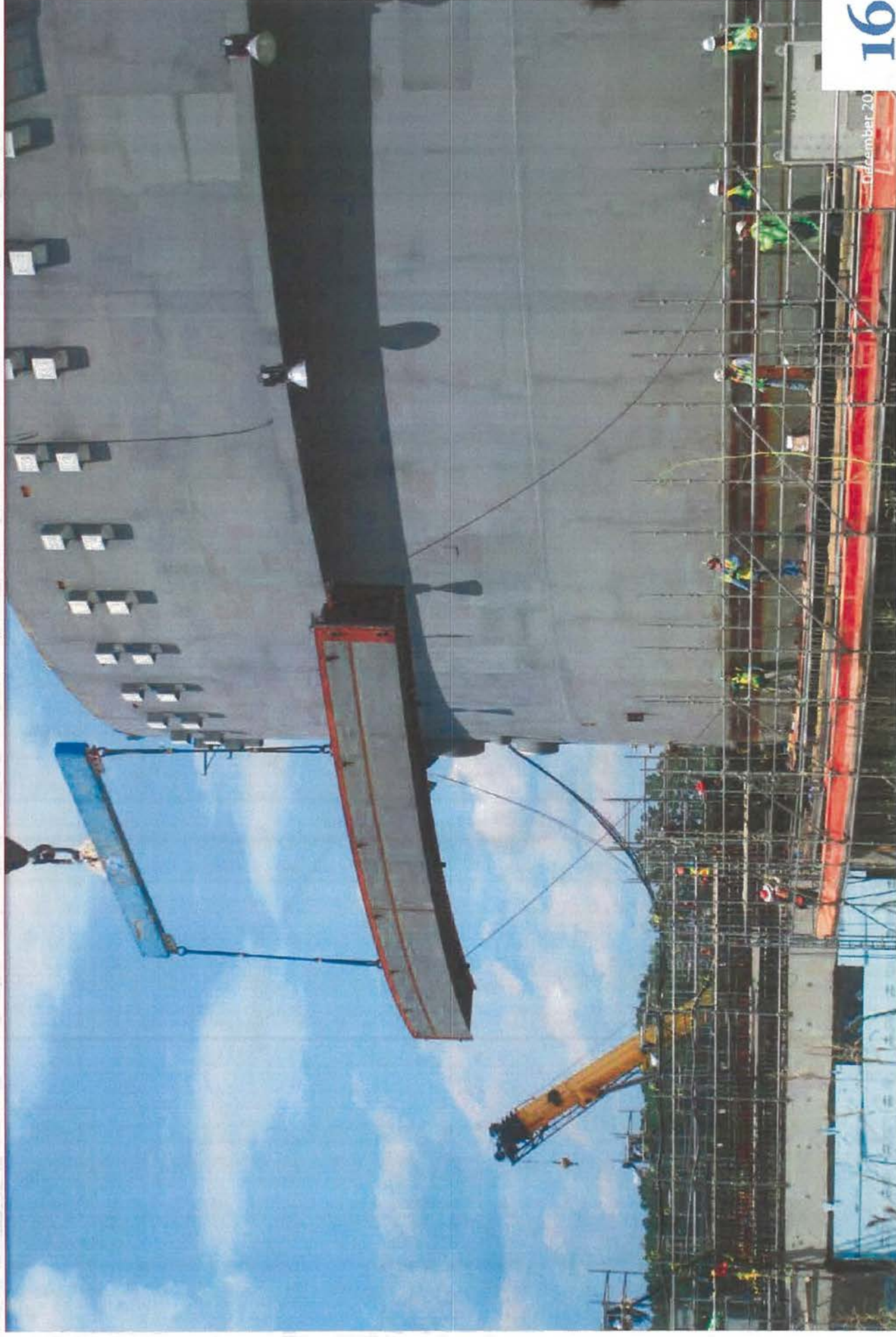
14

Shield Building/Containment Vessel



Unit 2 Shield Building Assembly

2017-11-29 3:20 PM V011022331



December 20

16

Shield Building Panel Status

G.J.E-Mails.2016.Vol.1.002332

Unit 2

- ▶ 113/167 panels on-site
- ▶ Courses 01 and 02 installed and filled with concrete
- ▶ Course 03 installation underway
- ▶ 16 courses in total

Unit 3

- ▶ 36/167 panels on-site
- ▶ None yet installed

SCE&G's Settlement with the Consortium

Cal. E-Filed 2016 Vol 1 002339

	Order #2015-661 (Prior EPC)	Amended EPC	Fixed Price Option
Guaranteed Substantial Completion Dates	Unit 2 - June 2019 Unit 3 - June 2020	Unit 2 - August 2019 Unit 3 - August 2020	
Capital Cost (SCE&G 55% share)	\$5.247 billion	\$5.492 billion	\$6.757 billion
Future Escalation to Westinghouse as 6/30/2015*:	\$794 million	\$813 million	\$19 million*
Total Expected Project Cost (SCE&G 55% share)	\$6.827 billion	\$7.113 billion	\$7.601 billion
Liquidated Damages	\$155 million @ 100% \$86 million - SCE&G	\$926 million @ 100% \$509 million - SCE&G	\$676 million @ 100% \$372 million - SCE&G
Bonuses	Capacity Performance Related	Completion - Capacity Performance bonus removed \$550 million @ 100% \$303 million - SCE&G	\$300 million @ 100% \$165 million - SCE&G
Change in Law Language	Generally defined	Explicitly defined - Formal written adoption of a new statute, regulation, requirement, or code or new NRC regulatory requirement that did not exist as of this amendment	

*The Fixed Price Option, regardless of date of acceptance, would fix Project Costs and shift the risk of escalation (excluding escalation on owner's and transmission costs) to Westinghouse as of June 30, 2015. Total Gross Escalation recorded as of 6/30/2015 is \$386 million. Under the Fixed Price Option, Total Gross Escalation remaining on the project is estimated to be approximately \$145 million.



Project Challenges

G.J.E-Mails.2016.Vol.1.002334



- ▶ **Transition Between EPC Contract Holders and Construction Management**
- ▶ **Modules, Modules, Modules!**
- ▶ **Shield Building Air Inlet Tension Ring and Roof Design**
- ▶ **Productivity**
- ▶ **Mechanical, Electrical and Instrumentation & Controls Installation**
- ▶ **Regulatory Compliance**
 - ▶ **License Amendment Requests (LARs)**
 - ▶ **ITAC (873/unit required; 19 on U2 and 16 on U3 verified by NRC)**
- ▶ **Start-Up**
- ▶ **Operations and Support Staff Readiness**

Conclusions

G.J.E-Mails.2016.Vol.1.002335



- ▶ **Recent independent study indicates BLRA methodology reduces costs**
- ▶ **Still a diverse and non-GHG source of power**
- ▶ **Project faces significant, but not insurmountable, challenges**
- ▶ **Unit 3 will need substantial improvement in all areas to meet the date for federal tax credits**
- ▶ **Progress has been made in the general areas of the site and the turbine island**
- ▶ **Consolidation under Westinghouse is viewed positively by SCE&G**
- ▶ **Addition of Fluor should also be positive**



Status of the V. C. Summer Units 2 & 3 Nuclear Power Plants

Presentation to the Electric Cooperatives of South Carolina

Gary C. Jones, President of Jones Partners, Ltd.

March 3, 2016



Brief CV of Gary C. Jones

G.J. E-File, 2016, Vol.1, 002337



- ▶ 45+ years in the nuclear power industry
- ▶ 32 years with Sargent & Lundy (S&L) in Chicago, Illinois
- ▶ 16 years as an Owner/Senior Vice President of S&L
- ▶ 2 1/2 years with the International Atomic Energy Agency (IAEA) in Vienna, Austria
- ▶ Led the design and engineering on 3 major nuclear power plants
 - ▶ LaSalle County (Commonwealth Edison)
 - ▶ Marble Hill (Public Service Indiana)
 - ▶ Braidwood (Commonwealth Edison)
- ▶ Provided engineering, design and consulting services to over 50 nuclear power plants in the United States
- ▶ Professional project experience in Armenia, Canada, China, El Salvador, Finland, Hungary, Mexico, South Korea and Ukraine as well as throughout the United States
- ▶ Retained by South Carolina Office of Regulatory Staff (ORS) since August 2011
- ▶ Registered Professional Engineer in Missouri and South Carolina

A Very Good Idea in 2008

G.J.E-Mails.2016.Vol.1.002338



Why?

- ▶ Updated NRC regulatory environment under 10 CFR 52, which allows for a combined license to both construct and operate a plant
- ▶ Modular Construction
- ▶ Certified Design
- ▶ Success in Asia
- ▶ Base Load Review Act (BLRA) in South Carolina
- ▶ Source of non-GHG emitting and diverse power
- ▶ Engineering, Procurement and Construction (EPC) Contract

Regulatory environment not as good as hoped

- ▶ Combined Construction and Operating License (COL) was delayed
 - ▶ 9 months until March 30, 2012
- ▶ "Build what you license vs. license what you build"
- ▶ Very strict literal compliance via NRC oversight
- ▶ License Amendment Requests (LARs)
- ▶ First plants through the Inspection, Tests, Analyses and Acceptance Criteria (ITAAC) process
- ▶ Not as much credit for previous experience in China as hoped
- ▶ Impact of changes from Fukushima accident

Experience Since 2008

G.J.E-Mails.2016.Vol.1.002340



Modular Construction

- ▶ Fabricators unable to reliably meet schedule and quality requirements
- ▶ Continuing design changes
- ▶ Inadequate constructability reviews
- ▶ Reassignment and de-scoping of fabricators

Certified Design

- ▶ Not as complete as anticipated
- ▶ Lessons learned at Chinese and sister plants
- ▶ Compliance issues with codes, standards and commitments
- ▶ SCE&G requested changes

Experience Since 2008

G.J.E-Mails.2016.Vol.1.002341



Asian Schedules Could Not Be Duplicated

- ▶ More rigorous regulatory environment
- ▶ Construction productivity rates lower than planned

BLRA Remains an Essential Element to Success

- ▶ Stable environment ensures project financing
- ▶ Independent study shows plant is still a positive

Still a Source of Non-GHG Emitting Power

- ▶ More focus on this issue due to EPA 111d
- ▶ Diversity in power supply remains important

EPC Contract

- ▶ Multiple Changes in Ownership
 - ▶ Westinghouse/Shaw Stone & Webster
 - ▶ Westinghouse/CB&I Stone & Webster
 - ▶ Westinghouse (with Fluor as a sub-contracted construction manager)
- ▶ Multiple Amendments
- ▶ "Change in Law" provision interpretation led to disagreements
- ▶ Designer vs. Constructor

Current Status

G.J.E-Mails.2016.Vol.1.002343



Most of the following information is taken directly from a December 9, 2015 SCANA presentation at the 2015 Wells Fargo Energy Symposium. Some information, including the photograph on the first slide, was taken from a presentation given by SCANA on its February 18, 2015 Fourth Quarter and Full Year 2015 Earnings Conference Call.

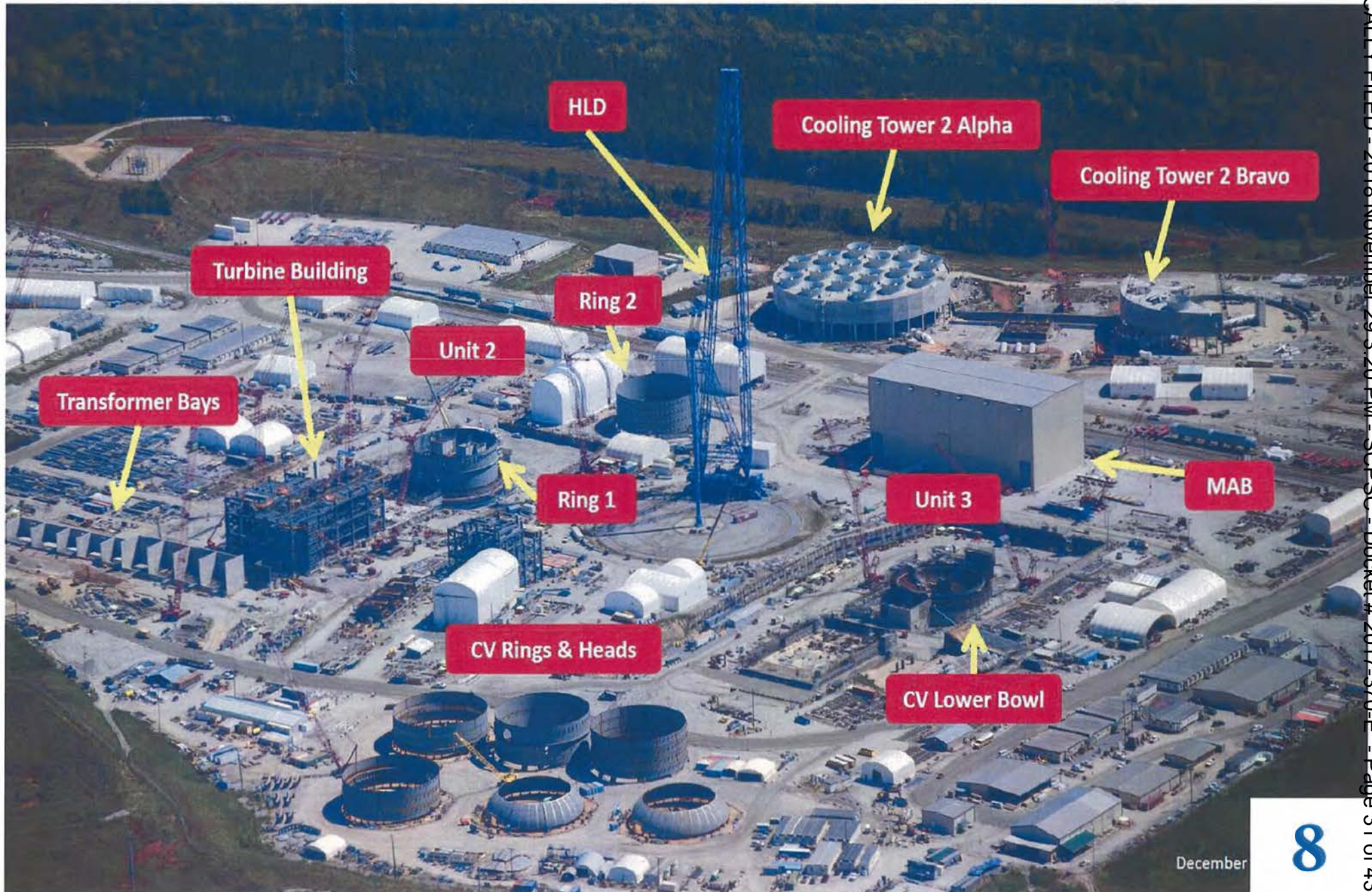
These presentations are available from the SCANA website at

www.scanacorp.com/investors/webcasts-presentations

Site Overview

(Picture from September 2015)

G.J.E-Mails.2016.Vol.1.002344

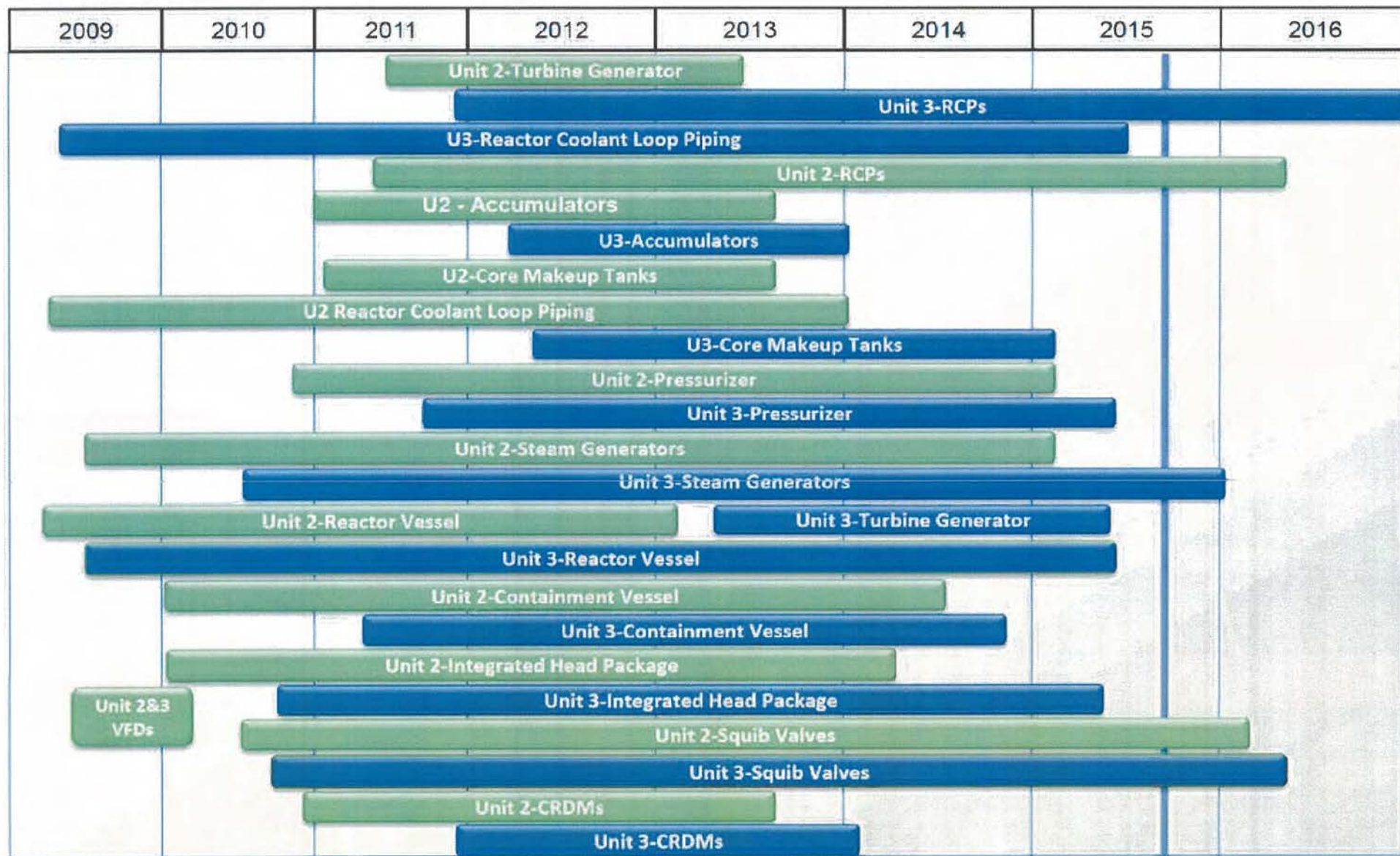


December

8

Status of Major Equipment

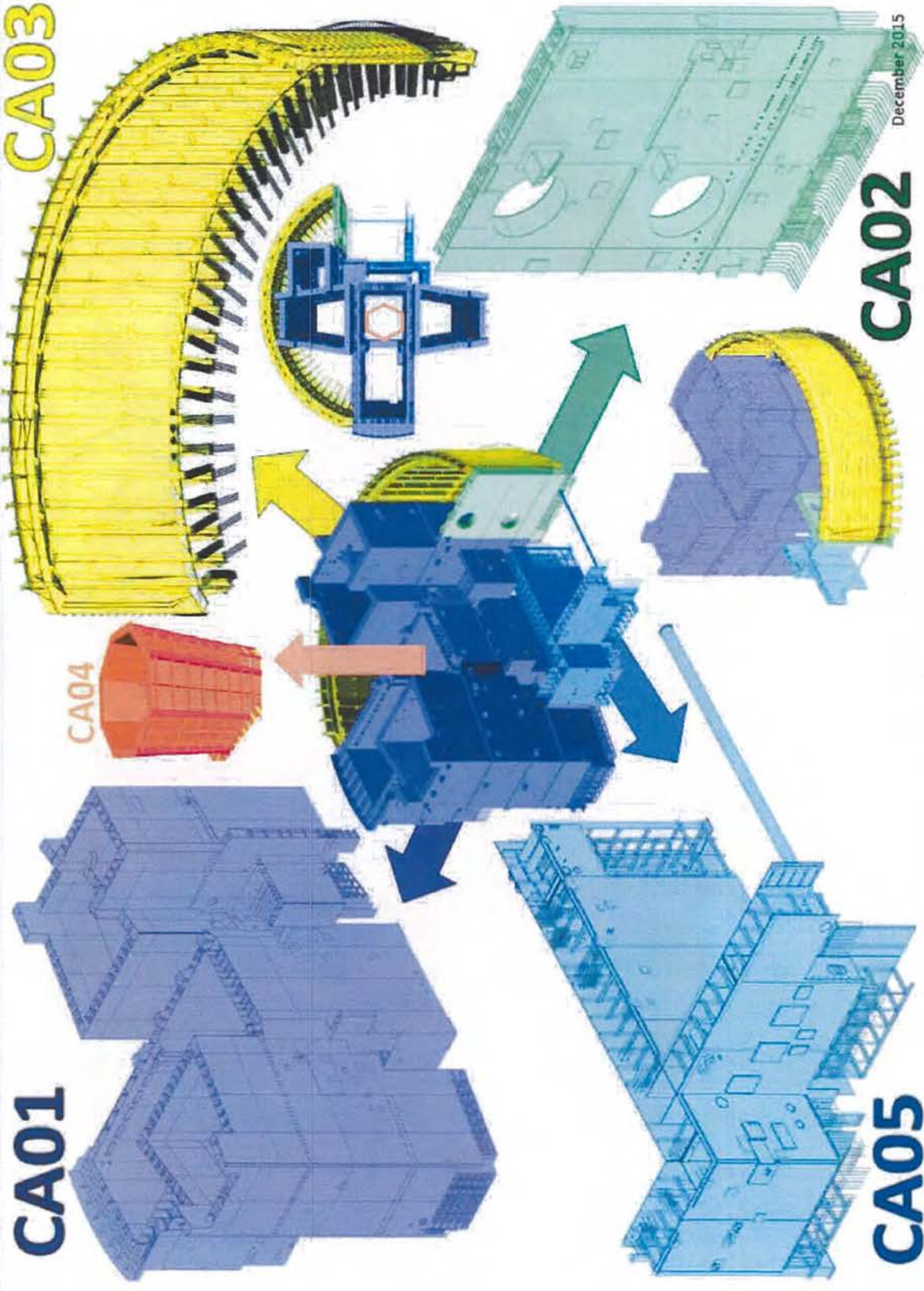
© J.E. Mills 2016, Vol.1.002345



December
Current Position

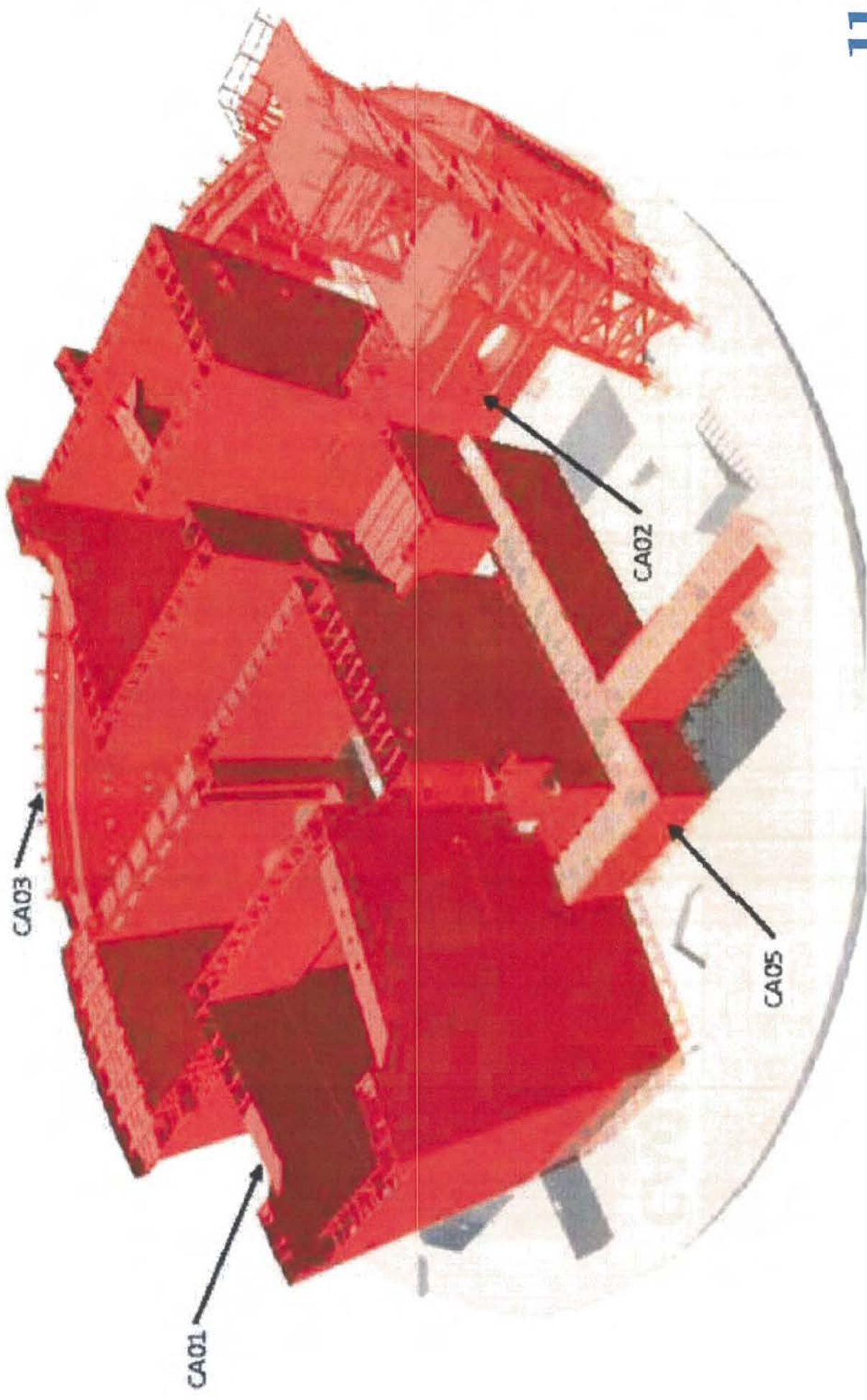
“Big Five” Modules Inside Containment

CA Modules



“Big Five” Assembled

G.J.E-Mails.2016.Vol.1.002347



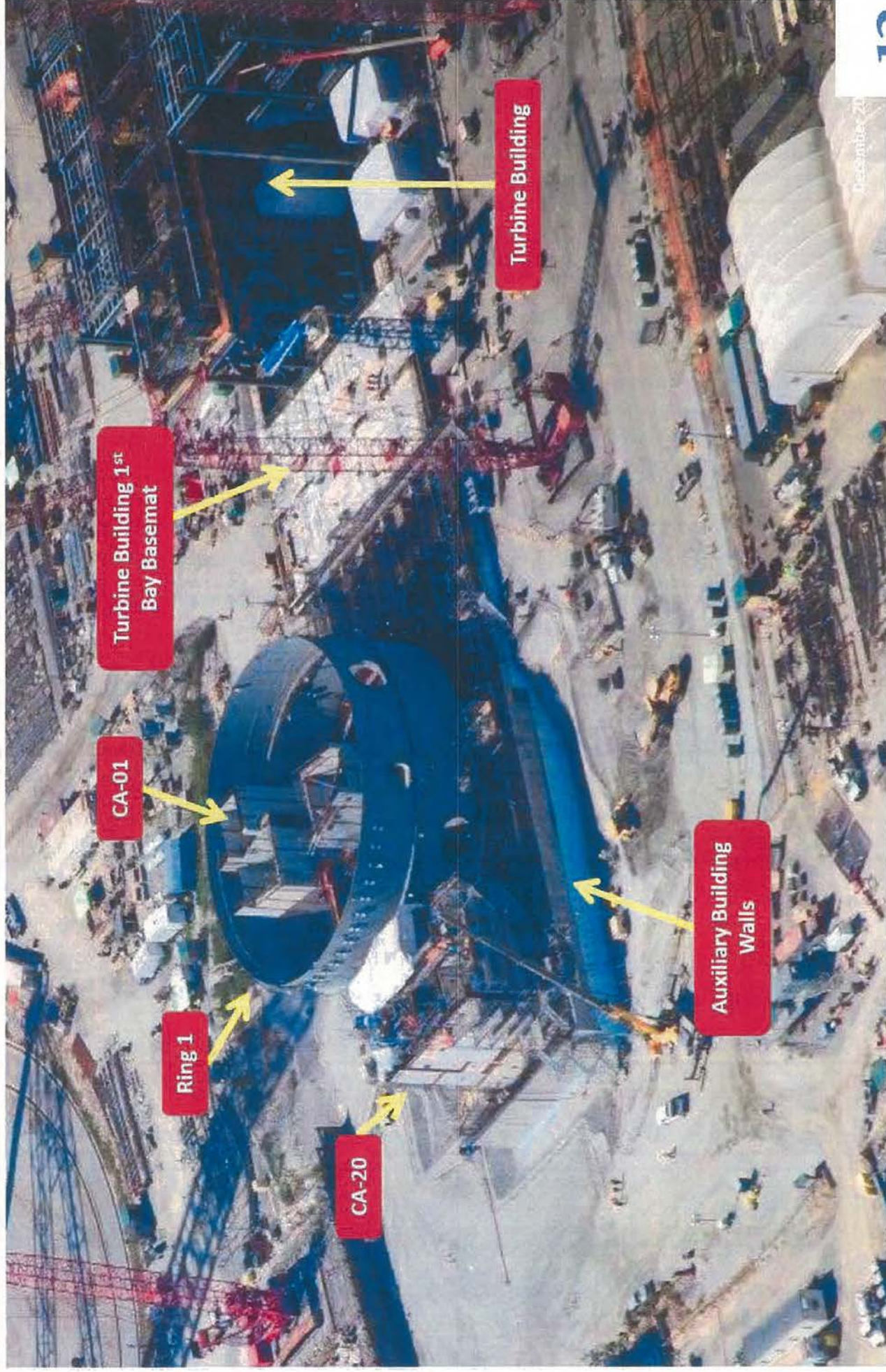
Module Status

G.J.E-Mails.2016.Vol.1.002348

	CA01	CA02	CA03	CA04 (No Concrete Required)	CA05	CA20
Unit 2	Installed Concrete fill to be determined.	Assembly Completed	17/17 sub-modules on site. 12/17 sub-modules on assembly platen. 3 sub-modules under on-site repair. Ready for hook June 2016.	Installed	Installed Concrete fill to be determined.	Installed Concrete fill is scheduled for April 2016
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	Inside of Containment					Outside of Containment

Unit 2 Nuclear Island

G.J.E-Mails, 2016, Vol. 1, 002349



Unit 3 Nuclear Island

G.J.E-Mails, 2016, Vol. 1 002350

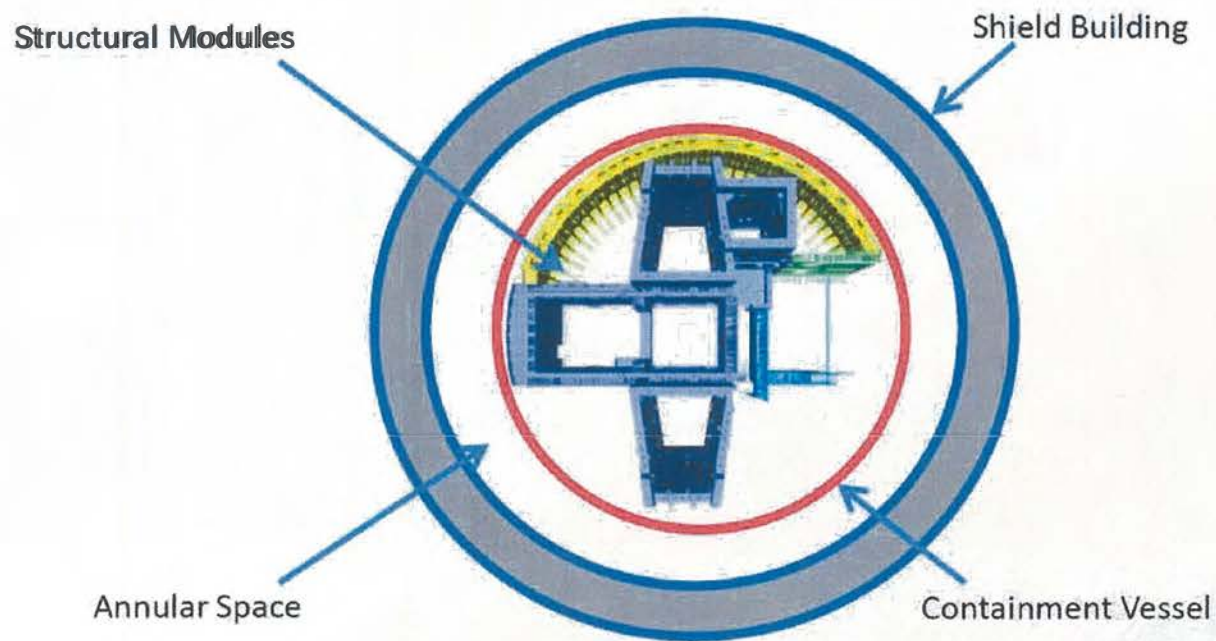


December 2015

14

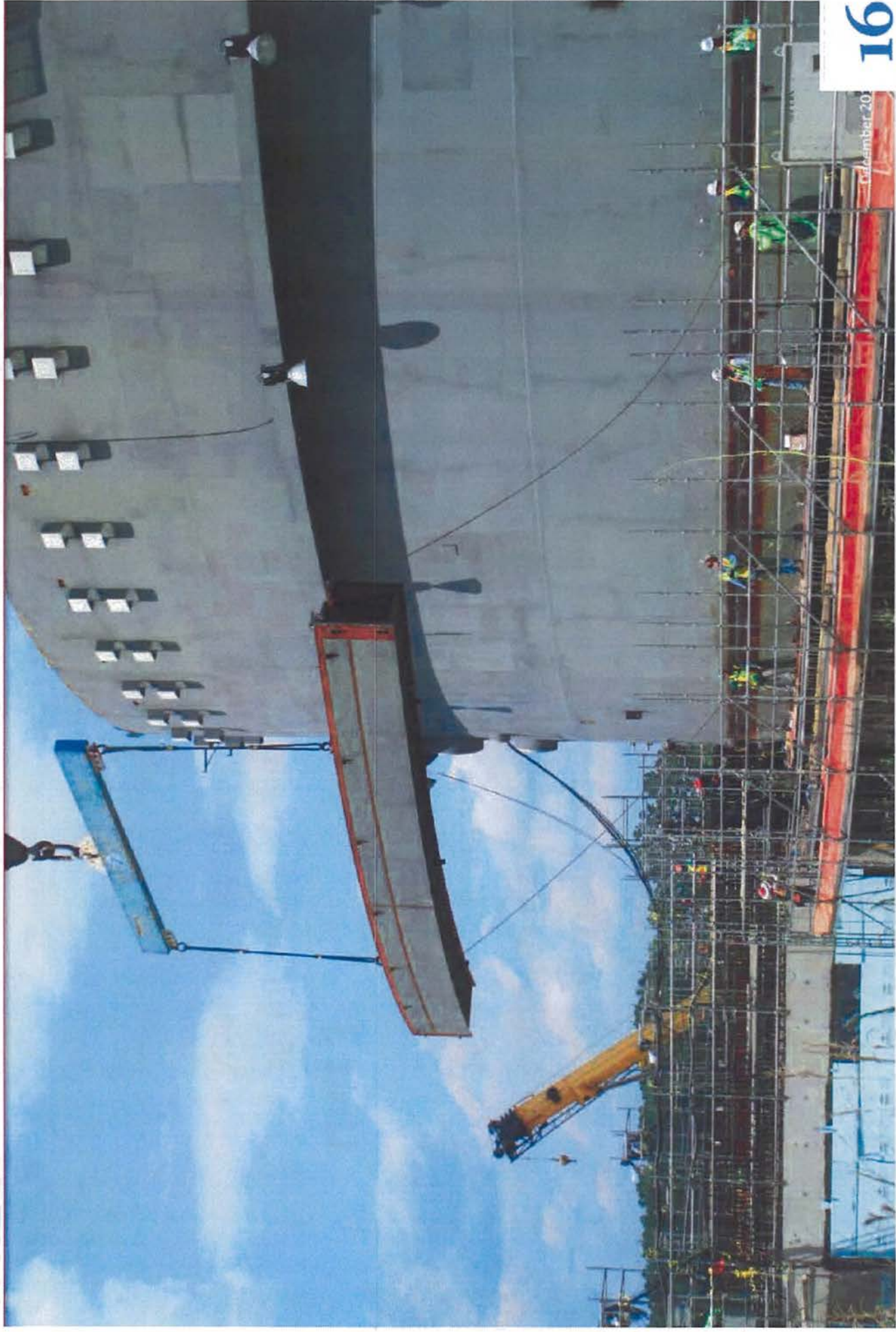
Shield Building/Containment Vessel

G.I.E-Mats 2018, Vol. V, 801381



Unit 2 Shield Building Assembly

JEE-9-000-2015 Vol. 1 1072352



19

Shield Building Panel Status

G.J.E-Mails.2016.Vol.11.002353

Unit 2

- ▶ 113/167 panels on-site
- ▶ Courses 01 and 02 installed and filled with concrete
- ▶ Course 03 installation underway
- ▶ 16 courses in total

Unit 3

- ▶ 36/167 panels on-site
- ▶ None yet installed

SCE&G's Settlement with the Consortium

	Order #2015-661 (Prior EPC)	Amended EPC	Fixed Price Option
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Project Challenges

G.J.E-Mails.2016.Vol.1.002355



- ▶ **Transition Between EPC Contract Holders and Construction Management**
- ▶ **Modules, Modules, Modules!**
- ▶ **Shield Building Air Inlet Tension Ring and Roof Design**
- ▶ **Productivity**
- ▶ **Mechanical, Electrical and Instrumentation & Controls Installation**
- ▶ **Regulatory Compliance**
 - ▶ **License Amendment Requests (LARs)**
 - ▶ **ITAAC (873/unit required; 19 on U2 and 16 on U3 verified by NRC)**
- ▶ **Start-Up**
- ▶ **Operations and Support Staff Readiness**

Conclusions



- ▶ **Recent independent study indicates BLRA methodology reduces costs**
- ▶ **Still a diverse and non-GHG source of power**
- ▶ **Project faces significant, but not insurmountable, challenges**
- ▶ **Unit 3 will need substantial improvement in all areas to meet the date for federal tax credits**
- ▶ **Progress has been made in the general areas of the site and the turbine island**
- ▶ **Consolidation under Westinghouse is viewed positively by SCE&G**
- ▶ **Addition of Fluor should also be positive**